

Release notes for ENDF/B Development n-044_Ru_099
evaluation

ENDF
B-VII.dev

April 26, 2017

- checkr Warnings:

1. A previous error halted parsing of the current section
MAT=4434, MF= 1, MT=451 (1): Parsing stopped

```
ERROR(S) FOUND IN MAT=4434, MF= 1, MT=451
SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      231 TO      285
```

- checkr Errors:

1. A variable is outside the allowed ENDF range
MAT=4434, MF= 1, MT=451 (0): Variable range

```
ERROR(S) FOUND IN MAT=4434, MF= 1, MT=451
MOD =      1 OUT OF RANGE      0 -      0      RECORD NUMBER      231
```

2. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 2, MT=151 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=4434, MF= 2, MT=151
SECTION 2/151 NOT IN DIRECTORY      RECORD NUMBER      287
```

3. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 1 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 1
SECTION 3/ 1 NOT IN DIRECTORY      RECORD NUMBER      591
```

4. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 2 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 2
SECTION 3/ 2 NOT IN DIRECTORY      RECORD NUMBER      620
```

5. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 4 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 4
SECTION 3/ 4 NOT IN DIRECTORY      RECORD NUMBER      648
```

6. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 16 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 16
SECTION 3/ 16 NOT IN DIRECTORY      RECORD NUMBER      666
```

7. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 17 (0): Directory (b)

ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 17
SECTION 3/ 17 NOT IN DIRECTORY RECORD NUMBER 677

8. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 22 (0): Directory (b)

ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 22
SECTION 3/ 22 NOT IN DIRECTORY RECORD NUMBER 683

9. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 28 (0): Directory (b)

ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 28
SECTION 3/ 28 NOT IN DIRECTORY RECORD NUMBER 697

10. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 32 (0): Directory (b)

ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 32
SECTION 3/ 32 NOT IN DIRECTORY RECORD NUMBER 707

11. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 51 (0): Directory (b)

ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 51
SECTION 3/ 51 NOT IN DIRECTORY RECORD NUMBER 715

12. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 52 (0): Directory (b)

ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 52
SECTION 3/ 52 NOT IN DIRECTORY RECORD NUMBER 733

13. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 53 (0): Directory (b)

ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 53
SECTION 3/ 53 NOT IN DIRECTORY RECORD NUMBER 749

14. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 54 (0): Directory (b)

ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 54
SECTION 3/ 54 NOT IN DIRECTORY RECORD NUMBER 765

15. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 55 (0): Directory (b)

- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 55 | RECORD NUMBER | 780 |
| SECTION 3/ 55 NOT IN DIRECTORY | | |
16. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 56 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 56 | RECORD NUMBER | 795 |
| SECTION 3/ 56 NOT IN DIRECTORY | | |
17. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 57 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 57 | RECORD NUMBER | 809 |
| SECTION 3/ 57 NOT IN DIRECTORY | | |
18. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 58 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 58 | RECORD NUMBER | 823 |
| SECTION 3/ 58 NOT IN DIRECTORY | | |
19. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 59 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 59 | RECORD NUMBER | 835 |
| SECTION 3/ 59 NOT IN DIRECTORY | | |
20. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 60 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 60 | RECORD NUMBER | 847 |
| SECTION 3/ 60 NOT IN DIRECTORY | | |
21. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 61 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 61 | RECORD NUMBER | 858 |
| SECTION 3/ 61 NOT IN DIRECTORY | | |
22. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 62 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 62 | RECORD NUMBER | 869 |
| SECTION 3/ 62 NOT IN DIRECTORY | | |
23. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 3, MT= 91 (0): Directory (b)

- | | | | |
|--|---|---------------|-----|
| | ERROR(S) FOUND IN MAT=4434, MF= 3, MT= 91 | | |
| | SECTION 3/ 91 NOT IN DIRECTORY | RECORD NUMBER | 879 |
24. Missing a section in directory so your directory is messed up. This error will break everything else
~~MAT=4434~~, MF= 3, MT=102 (0): Directory (b)
- | | | | |
|--|---|---------------|-----|
| | ERROR(S) FOUND IN MAT=4434, MF= 3, MT=102 | | |
| | SECTION 3/102 NOT IN DIRECTORY | RECORD NUMBER | 889 |
25. Missing a section in directory so your directory is messed up. This error will break everything else
~~MAT=4434~~, MF= 3, MT=103 (0): Directory (b)
- | | | | |
|--|---|---------------|-----|
| | ERROR(S) FOUND IN MAT=4434, MF= 3, MT=103 | | |
| | SECTION 3/103 NOT IN DIRECTORY | RECORD NUMBER | 911 |
26. Missing a section in directory so your directory is messed up. This error will break everything else
~~MAT=4434~~, MF= 3, MT=104 (0): Directory (b)
- | | | | |
|--|---|---------------|-----|
| | ERROR(S) FOUND IN MAT=4434, MF= 3, MT=104 | | |
| | SECTION 3/104 NOT IN DIRECTORY | RECORD NUMBER | 927 |
27. Missing a section in directory so your directory is messed up. This error will break everything else
~~MAT=4434~~, MF= 3, MT=105 (0): Directory (b)
- | | | | |
|--|---|---------------|-----|
| | ERROR(S) FOUND IN MAT=4434, MF= 3, MT=105 | | |
| | SECTION 3/105 NOT IN DIRECTORY | RECORD NUMBER | 939 |
28. Missing a section in directory so your directory is messed up. This error will break everything else
~~MAT=4434~~, MF= 3, MT=106 (0): Directory (b)
- | | | | |
|--|---|---------------|-----|
| | ERROR(S) FOUND IN MAT=4434, MF= 3, MT=106 | | |
| | SECTION 3/106 NOT IN DIRECTORY | RECORD NUMBER | 950 |
29. Missing a section in directory so your directory is messed up. This error will break everything else
~~MAT=4434~~, MF= 3, MT=107 (0): Directory (b)
- | | | | |
|--|---|---------------|-----|
| | ERROR(S) FOUND IN MAT=4434, MF= 3, MT=107 | | |
| | SECTION 3/107 NOT IN DIRECTORY | RECORD NUMBER | 961 |
30. Missing a section in directory so your directory is messed up. This error will break everything else
~~MAT=4434~~, MF= 4, MT= 2 (0): Directory (b)
- | | | | |
|--|--|---------------|-----|
| | ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 2 | | |
| | SECTION 4/ 2 NOT IN DIRECTORY | RECORD NUMBER | 978 |
31. Missing a section in directory so your directory is messed up. This error will break everything else
~~MAT=4434~~, MF= 4, MT= 16 (0): Directory (b)

- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 16
SECTION 4/ 16 NOT IN DIRECTORY RECORD NUMBER 1154
32. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 17 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 17
SECTION 4/ 17 NOT IN DIRECTORY RECORD NUMBER 1157
33. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 22 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 22
SECTION 4/ 22 NOT IN DIRECTORY RECORD NUMBER 1160
34. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 28 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 28
SECTION 4/ 28 NOT IN DIRECTORY RECORD NUMBER 1163
35. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 32 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 32
SECTION 4/ 32 NOT IN DIRECTORY RECORD NUMBER 1166
36. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 51 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 51
SECTION 4/ 51 NOT IN DIRECTORY RECORD NUMBER 1169
37. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 52 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 52
SECTION 4/ 52 NOT IN DIRECTORY RECORD NUMBER 1197
38. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 53 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 53
SECTION 4/ 53 NOT IN DIRECTORY RECORD NUMBER 1225
39. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 54 (0): Directory (b)

- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 54 | |
| SECTION 4/ 54 NOT IN DIRECTORY | RECORD NUMBER 1253 |
40. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 55 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 55 | |
| SECTION 4/ 55 NOT IN DIRECTORY | RECORD NUMBER 1281 |
41. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 56 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 56 | |
| SECTION 4/ 56 NOT IN DIRECTORY | RECORD NUMBER 1308 |
42. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 57 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 57 | |
| SECTION 4/ 57 NOT IN DIRECTORY | RECORD NUMBER 1335 |
43. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 58 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 58 | |
| SECTION 4/ 58 NOT IN DIRECTORY | RECORD NUMBER 1362 |
44. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 59 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 59 | |
| SECTION 4/ 59 NOT IN DIRECTORY | RECORD NUMBER 1385 |
45. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 60 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 60 | |
| SECTION 4/ 60 NOT IN DIRECTORY | RECORD NUMBER 1408 |
46. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 61 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 61 | |
| SECTION 4/ 61 NOT IN DIRECTORY | RECORD NUMBER 1431 |
47. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 62 (0): Directory (b)

- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 62
SECTION 4/ 62 NOT IN DIRECTORY RECORD NUMBER 1454
48. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 4, MT= 91 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 4, MT= 91
SECTION 4/ 91 NOT IN DIRECTORY RECORD NUMBER 1477
49. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 5, MT= 16 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 5, MT= 16
SECTION 5/ 16 NOT IN DIRECTORY RECORD NUMBER 1501
50. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 5, MT= 17 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 5, MT= 17
SECTION 5/ 17 NOT IN DIRECTORY RECORD NUMBER 1567
51. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 5, MT= 22 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 5, MT= 22
SECTION 5/ 22 NOT IN DIRECTORY RECORD NUMBER 1585
52. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 5, MT= 28 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 5, MT= 28
SECTION 5/ 28 NOT IN DIRECTORY RECORD NUMBER 1783
53. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 5, MT= 32 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 5, MT= 32
SECTION 5/ 32 NOT IN DIRECTORY RECORD NUMBER 1877
54. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=4434, MF= 5, MT= 91 (0): Directory (b)
- ERROR(S) FOUND IN MAT=4434, MF= 5, MT= 91
SECTION 5/ 91 NOT IN DIRECTORY RECORD NUMBER 1926

- **psyche** Warnings:

1. Non-threshold reaction with Q value differing from PSYCHE's expectations
FILE 3 / SECTION 103 / THE CALCULATED Q 5.19792E+05 DISSAGREES WITH THE GIVEN Q 4.88861E+05 (0): Iffy Q

FILE 3

SECTION 103

THE CALCULATED Q 5.19792E+05 DISSAGREES WITH THE GIVEN Q 4.88861E+05

• fudge-4.0 Warnings:

1. Missing a channel with a particular angular momenta combination
resonances / resolved / MultiLevelBreitWigner (Error # 0): missingResonanceChannel

WARNING: Missing a channel with angular momenta combination L = 0, J = 1.0 and S = 1.0 for "capture"

2. Potential scattering hasn't converted, you need more L's!
resonances / resolved (Error # 1): potentialScatteringNotConverged

WARNING: Potential scattering hasn't converged by L=0 at E=1000.0 eV, xs[0]/xs[0]=100.0% > 0.1%

3. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 0: total (Error # 0): CS Sum.

WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.29%

4. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.13%

• fudge-4.0 Errors:

1. Calculated and tabulated Q values disagree.
reaction label 14: n[multiplicity:'2'] + Ru98 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -7548210.13470459 eV vs -7.4699e6 eV!

2. Calculated and tabulated Q values disagree.
reaction label 15: n[multiplicity:'3'] + Ru97 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -17731753.65730286 eV vs -1.7702e7 eV!

3. Calculated and tabulated Q values disagree.
reaction label 16: n + H1 + Tc98 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -8562560.884552002 eV vs -8479440. eV!

4. Calculated and tabulated Q values disagree.
reaction label 17: n + H2 + Tc97 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -13616975.92475891 eV vs -1.34554e7 eV!

5. Calculated and tabulated Q values disagree.
reaction label 18: Ru100 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 9588939.9324646 eV vs 9.6732e6 eV!

6. Calculated and tabulated Q values disagree.
reaction label 19: n + He4 + Mo95 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -2418784.850357056 eV vs -2.3296e6 eV!

7. Calculated and tabulated Q values disagree.
reaction label 20: H1 + Tc99_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 404126.3212585449 eV vs 488861. eV!

8. Calculated and tabulated Q values disagree.
reaction label 21: H2 + Tc98_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -6337994.783615112 eV vs -6169320. eV!

9. Calculated and tabulated Q values disagree.
reaction label 22: H3 + Tc97_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -7359742.984146118 eV vs -7270270. eV!

10. Calculated and tabulated Q values disagree.
reaction label 23: He3 + Mo97_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -7020817.449951172 eV vs -6931140. eV!

11. Calculated and tabulated Q values disagree.
reaction label 24: He4 + Mo96_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 6735535.995819092 eV vs 6.8293e6 eV!

• njoy2012 Warnings:

1. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (0): GROUPT/conver (0)

---message from conver---cannot do complete particle production for mt= 16
only mf4/mf5 provided

2. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (1): GROUPT/conver (0)

---message from conver---cannot do complete particle production for mt= 17
only mf4/mf5 provided

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (2): GROUPT/conver (0)

---message from conver---cannot do complete particle production for mt= 22
only mf4/mf5 provided

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 28
only mf4/mf5 provided

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (4): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 32
only mf4/mf5 provided

6. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (5): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 91
only mf4/mf5 provided